

IN THE CLAIMS:

1. (Currently Amended) An apparatus for detecting foreign particles and defects, comprising:

an illumination optical system to irradiate a surface of an object substantially simultaneously from different angles using a plurality of laser beams having different wavelengths, irradiation being onto a substantially same location of said the object;

a detection section to divide and separately detect each of the laser beams scattered from the object by the irradiation; the scattered light reflected from the location of said object by each of said wavelengths;

a conversion section to convert the detected laser beams scattered light of the respective detected wavelengths from the object into an electrical signal; and

a processing section to extract a signal corresponding to the foreign particles or defects from the electrical signal converted by the conversion section, and to classify the extracted signal into predetermined foreign particle or defect categories;

a discernment section to discern a state of said foreign particle and defect according to said electrical signal of the respective wavelengths,

wherein an irradiation location of the laser beam moves with regard to a surface of the object, in detection, according as which point moves, the state of said foreign particle are separately detected from that of said defect.

2. (Currently Amended) An apparatus for detecting foreign particles and defects, comprising:

a stage to support and revolve rotate an object in being subjected to detection;

an illumination optical system to irradiate a surface of the object substantially simultaneously from different angles using a plurality of laser beams having different wavelengths, irradiation being onto a substantially same location of a surface of said the object in a simultaneous scanning operation;

a detection section to divide and separately detect each of the laser beams scattered from the surface by the irradiation; the scattered light reflected from the location of said surface by each of said wavelengths;

a conversion section to convert the detected laser beams scattered light of each of said detected wavelengths from the surface into an electrical signal; and

a processing section to extract a signal corresponding to foreign particles or defects from the electrical signal converted by the conversion section, and to classify the extracted signal into predetermined foreign particle or defect categories;

a discernment section to discern a state of said foreign particle and defect according to said electrical signal of each of said wavelengths,

wherein the above plurality of laser beams in said simultaneous operation being irradiated substantially simultaneously moves with regard to the surface of said the object in a spiral manner by a relative movement between said the stage and

illumination optical system, ~~which allows the state of said foreign particle to be~~
~~separately detected from that of said defect.~~

3. (Currently Amended) An apparatus ~~for detecting foreign particle and defect~~
according to claim 1, wherein said the illumination optical system is arranged such that
a laser having the plurality of wavelengths that are simultaneously emitted from a multi-
oscillation laser luminous source are separated by each of said the wavelengths into the
laser beams of said the different wavelengths.

4. (Currently Amended) An apparatus ~~for detecting foreign particle and defect~~
according to claim 2, wherein said the stage is arranged to move a position of a
rotational axis of said the object in detection relative to an irradiation position of said the
laser beam.

5. (Currently Amended) An apparatus ~~for detecting foreign particle and defect~~
according to claim 1, wherein an irradiation angle of said the laser beam with regard to
a vertical line taken on the surface of said the object includes a range from substantially
60° to 90° as well as a range from substantially 0° to 30°.

6. (Currently Amended) A method for detecting foreign particles and defects,
comprising: ~~the steps of:~~

irradiating a surface of an object substantially simultaneously from different angles using a plurality of laser beams having different wavelengths, irradiation being onto a substantially same location of an the object;

detecting by each of said the wavelengths, the scattered light reflected from the location of said the object;

converting the scattered light of each of said the detected wavelengths into an electrical signal; and

processing the converted electrical signal to extract a signal corresponding to the foreign particles or defects from the converted electrical signal, and classifying the extracted signal into predetermined foreign particle or defect categories;

wherein an irradiation location of the laser beam moves with regard to a surface of the object.

~~discerning a state of foreign particle and defect according to the electrical signal of each of said wavelengths so as to separately detect the state of said foreign particle from that of said defect.~~

7. (Currently Amended) A method for detecting foreign particles and defects, comprising: ~~the steps of:~~

supporting and ~~revolving rotating~~ an object;

irradiating a surface of the object substantially simultaneously from different angles using a plurality of laser beams having different wavelengths, irradiation being

onto a substantially same location of a surface of said the object in a simultaneous scanning operation;

detecting a scattered light reflected from the location of said the surface by each of said the wavelengths;

converting the scattered light of each of said the detected wavelengths into an electrical signal; and

processing the converted electrical signal to extract a signal corresponding to foreign particles or defects from the converted electrical signal, and classifying the extracted signal into predetermined foreign particle or defect categories;

~~discerning a state of said foreign particle and defect according to the electrical signal of each of said wavelengths;~~

wherein said the plurality of laser beams moves relative to the surface of said the object in a spiral manner, ~~which allows the state of said foreign particle to be separately detected from that of said defect.~~

8-10. (Canceled)

11. (Currently Amended) An apparatus for detecting foreign particles and defects, comprising:

an irradiation means for irradiating a first laser beam having a first wavelength onto a portion on a surface of an object in detection from a first incident angle, and a

second laser beam having a second wavelength onto the portion of the object from a second incident angle;

a first detection optical system to detect light scattered from the object in detection by the irradiation of the first laser beam;

a second detection optical system to detect light scattered from the object in detection by the irradiation of the second laser beam;

a processing means to process a first signal output from the first detection optical system and a second signal output from the second detection optical system, and to extract a signal corresponding to a foreign particle and a defect respectively; and

a means to display a result obtained by the processing means,
wherein the object in detection is rotating during the detection.

~~an irradiation means to divide an incident path of a laser beam with regard to an object in detection into a first incident path and a second incident path;~~

~~a first reflection optical system to introduce a scattered light of the laser beam in reflection from said object in detection into a first direction that is substantially vertical with regard to a surface of said object in detection;~~

~~a second reflection optical system to introduce said scattered light through a curved mirror into a plurality of second directions different from said first direction;~~

~~a comparison means to compare a first signal output from said first reflection optical system with a second signal output from said second reflection optical system in each case of said first and second incident paths; and~~

~~a means to display a result obtained by said comparison means,~~
~~wherein said foreign particle and defect are separately detected according to a~~
~~directivity of said scattered light in reflection.~~

12-19. (Cancelled)

20. (New) An apparatus according to claim 1, wherein the plurality of laser beams are cyclically deflected to sub-scan the laser beams with regard to a surface of the object, simultaneously with at least one of rotational and linear movement of the object.

21. (New) An apparatus according to claim 20, wherein the plurality of laser beams are cyclically deflected using at least one of a rotating mirror and an acoustic optical deflector.

22. (New) An apparatus according to claim 2, wherein the plurality of laser beams are cyclically deflected to sub-scan the laser beams with regard to a surface of the object, simultaneously with at least one of rotational and linear movement of the object.

23. (New) An apparatus according to claim 22, wherein the plurality of laser beams are cyclically deflected using at least one of a rotating mirror and an acoustic optical deflector.

24. (New) A method according to claim 6, wherein the plurality of laser beams are cyclically deflected to sub-scan the laser beams with regard to a surface of the object, simultaneously with at least one of rotational and linear movement of the object.

25. (New) A method according to claim 24, wherein the plurality of laser beams are cyclically deflected using at least one of a rotating mirror and an acoustic optical deflector.

26. (New) A method according to claim 7, wherein the plurality of laser beams are cyclically deflected to sub-scan the laser beams with regard to a surface of the object, simultaneously with at least one of rotational and linear movement of the object.

27. (New) A method according to claim 26, wherein the plurality of laser beams are cyclically deflected using at least one of a rotating mirror and an acoustic optical deflector.

28. (New) A method according to claim 11, wherein the first and second laser beams are cyclically deflected to sub-scan the laser beams with regard to a surface of the object, simultaneously with at least one of rotational and linear movement of the object.

29. (New) A method according to claim 28, wherein the first and second laser beams are cyclically deflected using at least one of a rotating mirror and an acoustic optical deflector.